

Didactic Sequence with the Theme "Drugs" for the Teaching of Nitrogen Functions

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Abstract: The present work is the report of an intern, who through the theme: "Drugs" shows the importance of the use of didactic sequence in the teaching of chemistry for the construction of concepts. The content was applied in classes of the 3rd year of high school, in a public school, in the city of Apucarana - PR. In this sense, the main types of drugs known in daily life were contextualized, soon after the properties of organic compounds and nitrogen compounds have been addressed. The relationships established through the theme resulted in a greater interest of the students in the didactic content, since it was possible to see practical results. Some did not know much about the chemical composition of the drugs, others even had contact, or knew someone who has already used some substance. The theme is part of the day-to-day and in this way, they were able to build and develop critical thinking at the end of the process.

Keywords: Didactic sequence, Supervised internship, Organic compounds, Drugs.

Introduction

Education is responsible for the intellectual transformation and social development of the masses and, for this, we highlight the importance of the future teacher in mediate knowledge with the way of applying. According to Cury (2005), even if it causes anguish and tears, even if young people are not the best examples in the present, education is the hope of a better future.

Therefore, the teacher assumes an extremely important and at the same time challenging role. Challenging in the search for tools that help in stimulating students, so that they have a critical view and build their point of view through scientific foundations. According to Pereira and Júnior (2016), a confluence between teacher and school environment is necessary, to provide the student with an appropriate environment in such a way that it is introduced into society already with the ability to discern and understand the medium to which it is inserted.

In this sieve, it is necessary to reflect pedagogical methodologies and practices that would help to mitigate the deficit learning routines of students in general, that is, inserting these methodologies, based on active methodologies, sharpening the student to solve problems and developing the cognitive power to work with current situations (Farias, 2016).

One of the practices applied in the educational context is the use of ICT (Information and Communication Technologies), this tool that in the educational environment has been gradually ascending (Prensky, 2010). Offering quality science education in educational institutions is of paramount importance, as it aims to improve the nation's education. This scenario is then part of the supervised stage, that provides a direct contact of the knowledge acquired during the course with the reality experienced in the classroom. According to Oliveira and Cunha (2006), supervised internship is an activity that opportunities the student to acquire professional experience and make contact with the teaching career, which is important for its future insertion in the labor market. During the internship period, the student can see education with another look, and seeks to understand both the reality of the school and the behavior of the students, teachers and professionals who make up that environment (Januário, 2008).

According to Maldaner (2006), undergraduate courses that do not propose the problematization of specific knowledge, teachers who will work using old programs, handouts, notes and textbooks, that their teachers provided when they were in high school. This is what keeps the vicious circle of archaic teaching. The main objective of the Supervised Internship is to provide the student with the opportunity to apply their academic knowledge in situations of professional practice, creating the possibility of exercising their skills. It is expected that, with this, the academic acquires a critical view of his area of activity and become a professional able to understand the needs of students and their work environment.

Method

The research

This work was conducted by an intern of the Undergraduate Chemistry course offered by the Federal Technological University of Paraná, in the city of Apucarana and was based on the application and analysis of a didactic sequence that aimed to teach the properties of organic compounds and nitrogen compounds to third year high school students, contextualizing the theme: Drugs. To carry out the discussion, four classes of fifty minutes each were necessary, in a third-year class of the evening period, being two classes in each of the days: 18/09/2018 and 25/09/2018.

Venue

The Teaching Sequence was applied at the State School Professor Izidoro Luiz Cerávolo, located in the central region of Apucarana, Paraná, in the neighborhood of 28 de Janeiro. The school operates in three shifts, offering elementary school, regular high school and vocational high school.

Staff

The class chosen for the application of the didactic sequence belongs to the third year of high school offered in the evening period. In all, 25 students participated in the classes, which were supervised by the teacher of Internship 3 and by the regular teacher of the school in question.

Authorizations

Through the Pedagogical Residency program, prior authorization was obtained from the school administration. In agreement with the subject teacher, the regular teacher, and the students, the class and the times were made available for the didactic sequence.

Choice of theme

The theme was chosen due to its increasing appearance in school environments, in order to make young people aware of the harmful effects that drugs cause to human beings. To this end, a school-society bond is created to clarify doubts and the consequences that drugs can bring to a citizen's life. The target audience that was taught the classes is in an age group that, according to statistical data, is the period in which most of them have their first contact with some kind of drug. Therefore, a preventive approach becomes effective in the sense of pausing at that moment the use of any narcotic. Social problems, social insertion, acceptance, rule transgression, among others, are the main causes for the adolescent to seek drugs.

As the school environment is the place where a student spends most of his time, and there he is eager for new knowledge and open to learning, the traditional subject is contextualized with experiences and instructs them on the proper use. Being present in the students' daily lives, the proposal is that they identify with the theme, thus arousing their interest in the Organic Chemistry classes, more specifically in the content of Nitrogen Functions, which is often approached in a traditional way, only addressing the nomenclature of compounds.

The sequence

The sequence was divided into four lessons, and the activities used are described in Table 1.

Table 1. Lessons Description

1st lesson	2st lesson	3st lesson	4st lesson
Division of the class into groups	Lesson on amines, amides, nitriles, nitro compounds in Datashow. (Traditional Organic Chemistry) with the use also of Molecular Model Kit.	Lesson on Drugs (types, effects, use, awareness).	Lesson on Drugs (types, effects, use, awareness).
Application of texts with historical aspects about some types of drugs and beginning of a debate;			Class on Drugs (types, effects, use, awareness).
Resolution of a problematization questionnaire (identification of the group in the structural formula of the Drug);			
Debate some experience on the subject.			

Elaborated during the planning stage the pedagogical didactic organization in Table 2.

Table 2. Didactic-Pedagogical Organization

Context Dimensions Dimension	
Title Dimension	Dimension Description
What do students consider drugs?	It works a scientific concept allied to a social issue, elucidating the main psychotropic effects of use, as well as the main problems that the use of drugs can cause for those who engage with it.
Organic functions and nomenclature of amines/amides and nitriles	Basic concepts of Organic Chemistry.

In the Table 3 discriminates the types of content covered during the lesson.

Table 3. Didactic-Pedagogical Organization

Type	Description
Factual	Assist the student in the construction of knowledge through playful activities on organic subjects such as amines, amides and nitriles, for introduction to the main theme that answers the problematizing question, which would be about Drugs.
Conceptual	Concepts, structural formulas and organic functions of amines, amides and nitriles. With prior knowledge that all the common drugs are organic substances, students are asked to read educational texts with historical contexts and with the main formulas of the active principles of some drugs, such as: nicotine (cigarette), THC (marijuana), benzoylmethylgonin (cocaine and crack), heroin, morphine, codeine, lysergic acid diethylamine (LSD) and N-Methyl-3,4-ethylenedioxyamphetamine (ecstasy).
Procedural	Relate the concepts acquired about organic compounds to the knowledge of the day-to-day, related to use, family problems, and others.

Also elaborated a conceptual map for better assimilation of content, in addition to working an evaluation process with students (see Figure 1).

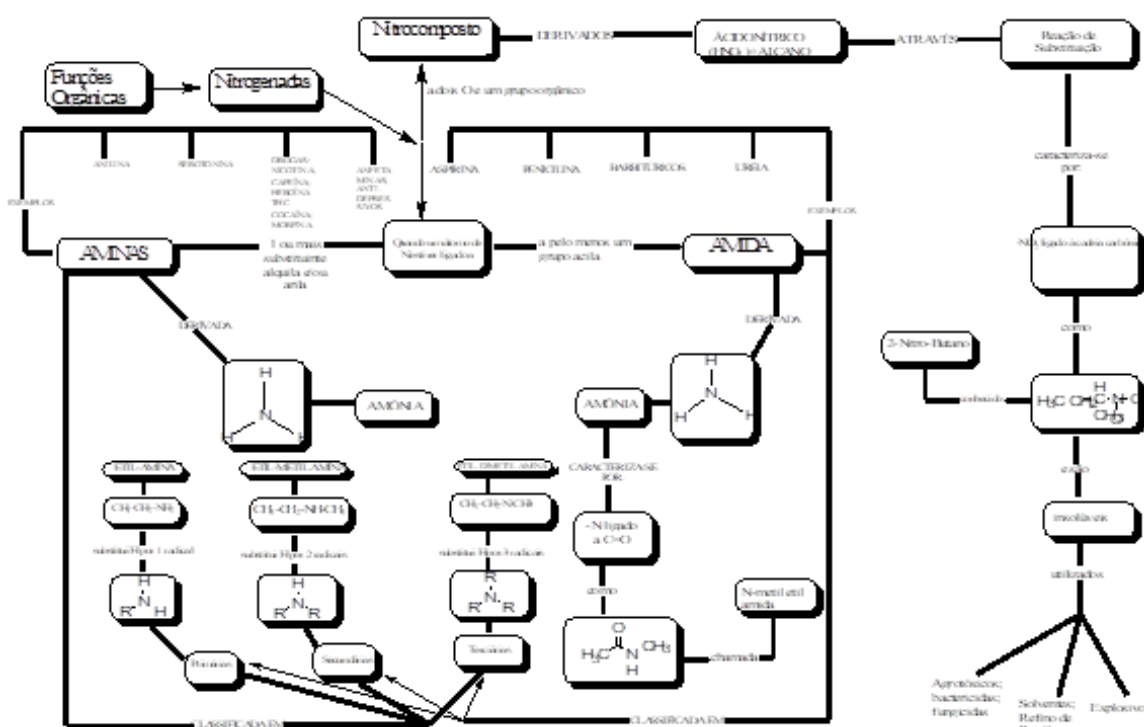


Figure 1. Conceptual Map

Description of the activities

First lesson

First, the classroom was divided into four groups, in order to launch a debate on the subject and distributed texts on some types of drugs, listing their historical aspects, physical, chemical and biological properties, with an exercise in which students debated the risks, experiences and also if they could identify the organic functions of the molecule, and discussed the initial problematization, which would be what do you understand by Drugs? It was important that everyone participated in the discussion. At this moment of debate the room remained a little excited, due to the desire to interact and tell about some kind of experience that each one had lived with some family member or even themselves with the referred theme. After the explanations about each type of drug, there was an exercise for the students to relate the type of carbonic function, and also to relate their experience with the said drug.

Second lesson

The second class was in a more traditional way, despite the use of resources for better understanding. Slides on the content covered and the molecular model kit (see Figure 2) provided by the Federal Technological

University of Paraná – in the Apucarana city, were used for better visibility and understanding of the types of amines and amides. The contents covered were: amines, amides and nitriles, with greater emphasis as requested by the professor of the subject in nomenclature.



Figure 2. Molecular Model Kit

Third lesson

The third class inserts the contextualized part. Thus, the main types of drugs are listed, as well as their effects and consequences. The third class had as its main objective to make the students aware of the incorrect use of some types of drugs, as well as to warn about the main risks that they can cause. For this, the main types of drugs and their effects were presented through slides. As a complement, it was sought from sources, through professionals of the Military Police of Paraná, which the trainee is also part of the professional staff, references of the Educational Program of Resistance to Drugs (Proerd), which aims to develop in young students skills in order to avoid influences to drugs and violence, as well as to promote protection factors. The awareness work was done mainly by the age group in which the students are inserted. The contextualization with organic chemistry made the students take interest in the subject itself.

Fourth Lesson

The fourth class was a continuation of the third class, and ending with nomenclature exercises of some compounds done on the blackboard, requested by the subject teacher, with the purpose of a future evaluation by the teacher.

General description of the activities*Main difficulties encountered in carrying out the activities*

Some difficulties were encountered during the preparation of the classes taught. These difficulties made the trainee focus more on some very important topics related to the theme, as well as the organic material requested by the teacher. To this end, we sought with professionals who lecture in schools on the subject, materials that would complement the knowledge about drugs. Also, regarding the contextualization and historical aspects, it was searched in didactic materials, especially books, about the subject and the main types of drugs, relating them to the students' daily lives.

Considerations about the preparation and development of the didactic activity proposed by the school

The teacher of the subject asked me to review the content and focus mainly on the topic of Drugs, aiming for a better understanding and an educational nature regarding them, since the age group of the students was inserted in the phase in which the curiosity to use some narcotic substance is heightened, the class being more educational and preventive, showing the effects that Drugs can cause to the body.

Evaluation of the activities developed, highlighting the positive and negative points

Among the activities developed, the one that drew the most attention was when the students were asked if anyone knew or had ever used any type, all felt intimidated, or even repressed or ashamed to talk about. Some said that they had used a legal drug, such as cigarettes or medicines. Others questioned why only the harmful effects that illicit drugs cause, such as marijuana, were talked about. It was then passed on to them, that Marijuana is also used for medicinal purposes, however, because it is an illicit drug, and induces people to addiction, besides sustaining trafficking, which is prohibited in our country, we tried to clarify the issue in a clearer way to make them aware of the harm. Another positive factor was the use of the molecular model kit, where the students could see more clearly the molecule itself. Regarding the debate at the beginning of the class, one of the negative points would be the number of students and the question of structural organization of the room to launch the debate. The texts were difficult to read, due to the fact that the room was an auditorium, and all the students in each group could not read the text.

Self-evaluation

The Internship is the moment when we put into practice all the theory acquired during our academic life at the University. To seek new learning and to assume that we are not endowed with all the knowledge and that every day we learn new things makes us better able to face the challenges of everyday life. Living in the school environment has shown how much we need to dedicate ourselves more every day to learn and pass on the knowledge we have acquired. During the internship I learned to deal directly with the students, the school

management, and the teachers.

How the Pedagogical Residency program can contribute to the initial formation

The Pedagogical Residency through its integration actions, induces a better practical training for undergraduate students, inserting the student directly in the school. This insertion gives the student experience in his teaching area. It aims to improve, leading the student to leave the theory behind and apply the knowledge acquired in practice. It is of utmost importance that the student understands and experiences the reality of the educational institutions where he will work in the future.

Results

First lesson

Initially, the class was divided into groups and made a reading and discussed the initial problematization: What are Drugs? To do so, some supporting texts were listed with some types of drugs, in which the texts listed historical aspects, chemical composition, structural formula, and the damage they can cause when used. After reading the problematization, there was some kind of commotion, there was a common posture among the students, and then it was said to them that they could debate and question other teams about the main doubts about the substance they chose, without being afraid of making mistakes, since they were there to learn, drawing a parallel to the question of the problematization. After the debate started, some students opened up and said they had already had problems with family members and some even said they had already used narcotic substances. It was then questioned the main factors that lead the human being to enter the world of drugs and, as it is a well-known subject among the students, several of them mentioned situations that lead the human being to enter this world. There was also some curiosity about the historical aspects of some drugs. At the same time, each team had questions pertinent to the theme, which related the context and mainly to the content of the class, which was about Nitrogenated Compounds. There was then, during the lesson presented on slides, the recognition of the structural formula to identify the type of amine found in each drug. However, the readings of the texts at the beginning of the class served to obtain a greater participation from the students and it was observed that during the debate, some of them listed examples and situations from everyday life, and the theme is much discussed nowadays, without showing much difficulty in assimilating the content, since the students are used to the traditional method, where the teacher speaks and the student copies and memorizes the content. During the course of the debate the students started to participate more effectively in the discussions.

Second lesson

The second class went over the organic chemistry content, about amines, amides, and nitriles. The main focus was on the types, nomenclature and the main examples of each. A traditional slide show class covered all the main points mentioned above. It was also used the Molecular Model Kit, made available by the University,

which made the students assimilate the content better. The students had a good knowledge of the nomenclature in terms of the number of carbons, and only the nomenclature of amines, amides and nitrogen compounds needed to be reinforced.

Third Lesson

Because it was a more expository class, few questions were asked while going over the content. Some curiosity was generated among the students, which aroused their interest in knowing the consequences that some drugs cause in the body. The slides also showed some technical terms, such as tachycardia, tachypnea, mydriasis, sweating, hyperthermia, which were asked during the presentation and answered their doubts. A graph of tolerance x sensitization was used, which was also understood by the students. One of the factors that called attention was that the students already had some knowledge about some types of drugs, and one student questioned the question of only passing on the harmful effects of illicit drugs, and was answered that they can also use them for medicinal purposes, as long as they are controlled and supervised by a competent professional, until then, the drugs serve to sponsor trafficking and destroy the lives of human beings, when not consumed properly.

Fourth Lesson

In the fourth, some fixation exercises of the subject were performed, as a focus on nomenclature of compounds. Some organic exercises were passed to the students on the blackboard, and all of them were solved before the end of the class and corrected together with the students, where few had difficulties, because they didn't ask for help to solve them.

Conclusion

It was concluded that the use of the didactic sequence allowed students to better assimilate knowledge, since it was possible to contextualize the chemical concepts with the theme: Drugs. This relationship also helped them to understand the content more easily, since the class addressed day-to-day issues and is so commented on in the age group in which they are inserted. It was possible to observe the students' participation during the development of the activities. Thus, it is considered that the didactic strategies applied during the sequence allowed the social interactions in the classroom, since the students already had prior knowledge of the subject addressed in the contextualization.

Therefore, the theme selected and developed in front of different teaching strategies such as: use of resources, reading, discussion and debates, audio visual resources, among others, can be an efficient strategy to show the relationships between chemical knowledge, technology, society and environment.

Recommendations

From the applied didactic sequence, that new research on this theme will be studied and applied in educational institutions for the purpose of awareness and a didactic way of teaching organic chemistry.

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